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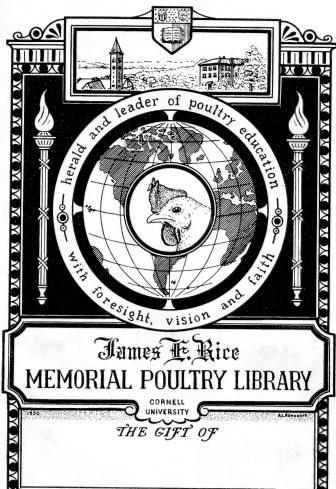


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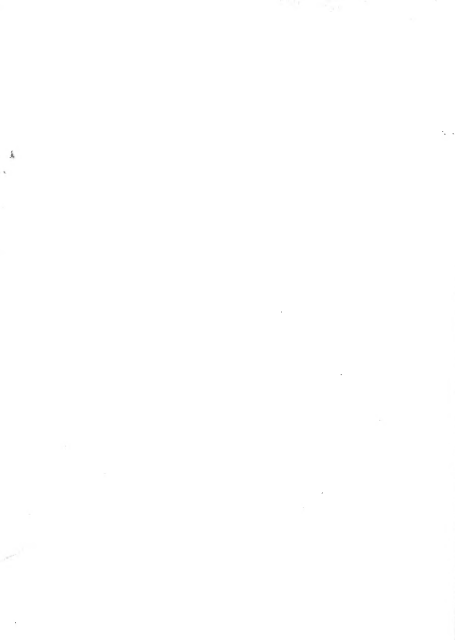


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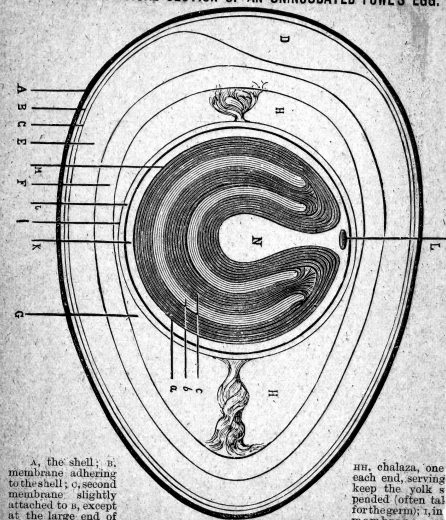



ARTIFICIAL INCUBATION,  
ITS THEORY AND PRACTICE,  
EMBODYING



London :  
EDWARD SPENCER & CO., 87, FENCHURCH STREET, E.C.  
1892.

# DIAGRAMMATICAL SECTION OF AN UNINCUBATED FOWL'S EGG.



A, the shell; B, membrane adhering to the shell; C, second membrane, slightly attached to B, except at the large end of the egg, where they separate and form D, the air-space; E, the white or albuminous part of the egg (the first layer—liquid); F, the white of the egg (second layer—semi-liquid), and G, the inner white;

connected with chalaza; J, very fine vitelline membrane; K, the outer part of yolk; germ; M, yolk or vitellus; N, utrid or latebra; a, b, c, are the separate layers composing the yolk.

HH, chalaza, one each end, serving to keep the yolk suspended (often tall for the germ); I, in membrane, cc

CHRISTY'S  
GUIDE TO POULTRY REARING:

SHOWING HOW TO  
RAISE EGGS AND POULTRY ECONOMICALLY  
AND PROFITABLY,  
WITH FULL DIRECTIONS FOR  
ARTIFICIAL INCUBATION AND CHICK REARING.



New and thoroughly Revised Edition.

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LONDON:  
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## GUIDE TO POULTRY REARING.

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THERE can be no doubt that Foreign competition is one of the great causes of our present depression in trade. Royal commissions may make enquiries, and may issue ponderous Blue Books, but unless English industry is ready to come forward and meet its rivals, with quantity, quality, and economy, the consumer must buy of the latter; and thus an incalculable sum of money is annually diverted from our shores. In no case is foreign supply greater than in the matter of our eggs and poultry; and in no case would it be easier to create a more flourishing Home Trade. Will it not raise a thrill of regret in the breast of many a little farmer, struggling along under the weight of bad, yes, unusually bad times, and of an honest hard working cottager, who, while he does not want his wife and little girls to turn out into the fields, for the rough, unfeminine labour of stone picking or weeding, to read the fact in these pages recently, that more than three millions and a half of our money, goes to enrich the farther-seeing, and therefore wiser peasantry of France, Germany and Belgium? Foreign produce of this kind stands a poor chance besides the genuine Home raised article; for no one needs to be told that eggs cannot be too fresh, and that it certainly is no improvement to fowls to be closely packed, and to have a long journey.

We have endeavoured in the following pages, to give some hints and advice as to how poultry may be made profitable, for it can and does pay very well, when properly cared for, and when cottager and farmer will work together.

In proof that one great reason of such an enormous rivalry from abroad is, that the English supply is wholly inadequate to the demand, we may state that one large Co-operative Store in London gave their contract for 3,500 turkeys to a foreign merchant, as no English dealer would undertake to provide them at the price. On inspecting the birds supplied it was noticeable that, though the weights were satisfactory, the condition and quality were very poor, many of them being much bruised, and the skin in some cases being broken. We used in some counties in England to produce a good supply of turkeys, but a succession of wet summers has been very disheartening to poultry keepers. Ireland is coming well to the fore, as a poultry market, and this is greatly attributable to their care in the selection both of stockbirds and foods, the increasing use of Incubators there, and the excellent manner in which they now pick and pack their birds.

For really forward poultry Incubators are necessary, as it is practically impossible to obtain broody hens in winter. Incubators now, can be had at very low prices, and on the simplest principles.

Cottagers in the country are beginning to awake to the fact, that attention to poultry rearing, and fruit and vegetable growing, amply repays them. Many of them come and consult us, telling us of the high prices they have realised by the *early birds*, and saying that with the amount of experience they have gained by working on a small scale with the Incubators, they feel that they could still do more.

Another great feature in poultry keeping at the present time is that many people in the country have greenhouses which they use for growing tomatoes and grapes. During the winter months these are not very much used, but by placing Rearing Mothers in these glasshouses there is quite sufficient protection from wind and rain to enable early young fowls to get well ahead before they are turned out into the fields. Such fortunate persons can for the small sum of £6 start poultry rearing with a 40-Egg Incubator, a Drying Box, and

a Cottager Rearer ; and the less fortunate ones, without an available greenhouse, can for another 25s. obtain an Out-door Rearer, with a glass covered run (No. 62).

With the convenience that now exists for sending dead poultry to the London markets or to adjoining towns, they are sure to command, if properly prepared, a very high price, for this reason—the restaurants and large hotels in London must have every day an enormous number of fowls of proper size and good form. So urgent is this demand that they do not now even put the price upon their order ; they rely upon the salesmen who supply them sending the first thing in the morning from the markets what they require, the order having been sent down the night previously, and although there are millions of fowls sent from Russia, Canada, America, and even New Zealand, in the cold air chambers, these fowls hardly influence the price, because they go to a lower class of restaurant and hotel and into private consumption.

This last spring many people had their young chickens just hatched from the Incubators in greenhouses when the sun was upon them, and the temperature at 80°. Of an evening, when it cooled, the small chicks ran under the Rearing Mother, and they were out again first thing in the morning. Any one who tries this plan will be perfectly amazed to see how rapidly these small things thrive and grow fat.

Those who have visited Egypt will recall how little trouble is necessary to rear young poultry ; this is principally due to their not being coddled in a small room at a high temperature without change of air.

All cottagers should be encouraged to keep poultry for the sake of the eggs, which already in some rural districts are becoming a very nice addition to the weekly earnings of the breadwinners. But it is a branch of industry in which there is great space for development ; the same may be said of the growing of fruit and vegetables

for the markets in the larger towns. In the southern counties, the labouring classes are waking up to the value of their gardens and allotments towards this end; and we could mention many instances in which after the family has been well supplied with garden produce, the excess has proved sufficient to pay the whole rent. If the wife understands the rearing of chickens—and few country-bred women do not seem to do this intuitively—it will be a further source of gain. To do this successfully, is no secret; it depends first on quiet for the Incubator or sitting hen, then on warmth and nourishing food for the chicks.

The stock birds should be changed once a year, for old hens cannot be depended upon to lay either as early or as regularly as pullets. Besides which, a well-fed fowl in its second year is excellent eating. It commands a fair price in the market, and is a far more profitable bird for family consumption than a very young chicken. Few people are aware how many different ways there are in which a fowl may be cooked. Here are one or two hints. One of the most delicate and nourishing soups possible, may be made by gently stewing a fowl (with its neck and feet included) till the meat can easily be detached from the bones. Free this from the skin and sinews, and pass it through a sausage machine, or else chop it very fine, and press it into a shape; and it will prove when seasoned a very nice addition to the breakfast or lunch table. Or again, select one of the fattest of the old birds. It is a very good plan, as soon as it is killed, to lay it on its back, and press its breast bone firmly down, with the palm of the hand. This forces the side bones close together, and very much improves its appearance. When plucking it, should the feather stumps be difficult to extract, dip it for a few seconds in boiling water. After it has been cleaned and drawn, ready for cooking, take, if procurable, a few vine leaves, or failing these, two or three clean cabbage leaves. Place these all round the fowl, and then wrap it up in a soft linen cloth. Then bury it about one foot under ground for

from eight to twelve hours. If roasted or boiled—perhaps this latter is better—all toughness will have entirely disappeared, and in its place will be a flavour finer than that possessed by any quite young bird.

But we must go back to our poultry yard, and must not forget that a most important item in profitable poultry keeping, is to have a warm, secure, quiet house. Foxes are a source of much trouble in many country places, and in cold weather are often wonderfully bold in their robberies. It adds much to the security of the roosting place, if the opening be made near the roof, rather than on the ground. When a slide is near the ground, it is often forgotten and left unclosed, while instances have been known of foxes raising it themselves; but a fox does not care to mount so incomprehensible a thing to him as a perch ladder. Another benefit of an elevated opening is, that it secures perfect ventilation, and permits the escape of ammonia, and other gases: and, to add another point in its favour, heavy hens need not fly up from the floor to go to roost. They walk up their ladder, and on from the opening to their perches. Every fancier admits that it is a frequent source of accidents, when large birds like Brahmas or Cochins have to make a jump or flight to a height considerably above them. This is the cause that may often be assigned for strains and ruptures.

The nest boxes should be placed about midway between the roof and the floor and the hens can then move easily on to them. This plan saves the eggs from being eaten by rats, and is in every way cleaner, drier, and better than if they are quite on the ground. The straw or hay in them, should be frequently changed, and a small square of turf might be advantageously placed at the bottom also. The poultry house should be cleaned out at least once a week, a few dry ashes scattered over the floor, will tend to make the task easier, and will greatly lessen unpleasant smell.

The success and profit of poultry keeping depend in a great

measure upon the feeding stuffs employed. To obtain the best results, naturally, we must feed our birds well; but many persons think they have done all that is necessary when they have thrown down a few handful of grain. This will keep one's birds alive, and in fair condition, but matters might be much improved from an economical point of view. Change is quite as essential to animals as it is to men, and in the country we can give this at very small cost. Most cottagers keep a pig, and a very little tithe from piggy's pail may be boiled up with some bran, rice, and any scraps or crusts or bits of grease into a mess, that the fowls will eat greedily. Potato parings, cabbage leaves, bits of onion, in short anything from the garden ought to find its way to the poultry. With respect to the grain we give them, it is not advisable always to feed with the same sorts. Maize, barley, a few oats, occasionally buckwheat are all good food. Wheat is good for chickens, but is not so desirable for laying hens. Chickens require a nourishing food, which must be given in small quantities about every two hours. They need nothing for the first twenty-four hours. After that, bread crumbs and chopped eggs, moistened with milk, and crushed rice or millet, form the best food for them, up to the fourth day. Then oatmeal porridge mixed with water or milk, or barley meal and curds, raw onions, prickly comfrey, and lettuces chopped very fine, may be given with advantage for a change. It is as well to make as much variation as possible for young chickens. They do not require anything to drink for the first four days: after which, milk, or milk and water may be given sparingly.

In stocking one's yard, much must be left to individual tastes and fancies. Most of the distinct breeds have some particular features or recommendations, which commend themselves for various reasons to different people; and to offer any comparison between the divers species would be far beyond the space at our disposal. We may, however, devote a few remarks to the classes of hens which

shew the least inclination to sit, and which may be designated as the "non-broody kinds." These are assuredly the most valuable for the poultry keeper, whose object is to gain the greatest supply of eggs, as well as to furnish the best birds for the table: for, to quote Mr. Tegetmeier's words, non-broody birds produce the maximum amount of food, with the minimum of offal or waste. From this point of view, the game bird is the standard of perfection, and the proof is to take a game fowl in good and fat condition, and weigh first the head, feet, bone and refuse: against which place the flesh. To fully appreciate this test, one should compare the result with a Cochin China of similar age, and reared under equal conditions. After allowing for the gross weight, it will soon be perceived that the "game bird" is far the more profitable. Such crosses as Houdans and Dorkings—Andalusian and Dorkings—Houdans and Andalusians, produce fine birds, and generally prove very good layers. If however, much game blood is introduced, a greater space and freedom will be required for the birds, as they can fly over ordinary enclosures, with the ease of a pheasant.

It is, however, to small raisers of poultry that we must look for an increased supply, and this will not be much enlarged unless a far greater number of people become poultry keepers. We must endeavour to impress upon our rural population the value that a wider system of this industry will be both to themselves and the community at large.

Not that we want them to rush to extremes and start Poultry Farming, even if they had the means. They may keep poultry upon as large a scale as they please, commencing in a small way and gradually extending their operations until they have six to a dozen Incubators, but never a poultry farm. Between Poultry Farming and Poultry Keeping on a large scale there is a great gulf fixed. As Mr. Kinard de la Bere, who is a well known authority upon poultry matters, has written, "the former is a theoretical delusion, the latter is a practical

paying industry, which all occupiers of land are in a position to follow with advantage.

Poultry Farming generally means the keeping of poultry alone; the crowding of a large head upon a limited area of land. Such attempts have always ended in disastrous failure.

Poultry Keeping on a large scale is the keeping of a large head of fowls by landowners or tenant farmers, not crowding a quantity upon a limited area, but upon the only proved rational and paying system, that of spreading a given number of separate flocks or head of fowls upon an extensive and sufficient acreage."

We would like then, all our cottagers to be poultry keepers, and those who can only start in a small way may take heart from the fact that **the three and a-half million worth of eggs which we annually import are mainly contributed by cottagers.**

In no one of the countries from which we import our eggs will a poultry farmer be found, or even a poultry keeper on a large scale, in fact, the cry in the agricultural journals abroad is much the same as it is here, viz., that farmers will not take the trouble to rear or look after poultry. This department they inevitably leave to their wives, and these latter simply shirk the responsibility. At the different seaports there are egg merchants, and these periodically send their agents through the various villages to collect the eggs, which are in due course packed and exported.

Once get our cottagers to take the matter up warmly, there is no reason why a similar system should not be adopted, only instead of exporting the eggs they could be disposed of at the nearest large towns, or if these by any means became over supplied they could be packed and sent to the metropolis.

### **GEESE.**

Since the greater part of the commons and waste lands of England have been enclosed, there has been a very considerable



diminution in the number of geese reared in this country. Some fifty years ago, well within living memory, almost every rural cottager kept a few geese, which practically found their own livings on the ill-drained swamps belonging to most villages. One feels tempted to regard it as a merciful dispensation of the laws of supply and demand that the medical crusade against feather beds was waged almost concurrently with the enforced decrease in the supply of geese, or what a prohibitive price we should have been asked now for this form of bed furniture!

But still in many country places there would be ample room to keep more of these birds; and a few hints how to do so advantageously may be of use to some. Stock birds should be one or two summers old. They will then commence laying early, provided that they are liberally fed, and are kept warm. They like worms, and even fish cut up small. In the course of the season, they ought to lay from 40 to 60 eggs. These should be carefully collected from day to day, and hatched out in the incubator. The young birds need plenty of air, but not too much water. It will be found very profitable, if it can be managed, to give them barley meal mixed with skim milk, as the goslings can be quickly forced on to a large size, and secure a highly remunerative return as "green geese:" *i.e.*, when they have the down upon them, and before the quill feathers appear. Of course it is not everyone that can find space to keep these birds, but there are plenty who live near a lane with a ditch on one side, and nothing could be better than this for geese. When they become broody they must have plenty of water at hand. No birds repay attention with greater interest than geese; and it is most important to keep them tame, and familiar with their master or mistress.

It used always to be said that nothing would feed after a goose. This is quite a fallacy, and if people only knew how much geese improve ornamental grass, there would soon be a great demand for them, by all the clubs and societies wanting a perfect lawn for tennis,

&c. As proof of this, we may mention that the grass on an old common is always beautifully firm and close, thanks to the broad feet of the goose, and its habit of just clipping off the blades of grass.

One occasionally hears the remark made by ignorant people, "Oh, I hate geese, they pick out the best grass, and leave the pasture so dirty," but the truth is that they improve any field on which they may be turned, only to mention one way in which they do this is, that in a short time they will have obliterated every trace of buttercups. The geese pull the plants out by the roots which they eat, leaving the stalks on the grass. The destruction of such a plant as *Ranunculus Acris* is a great improvement to all grass land, as it is not only injurious to any other animals eating it, but it spreads rapidly, and takes up the room of better feeding materials.

As a matter of fact, cattle and horses always like the pasture that has been worked over by a number of geese, provided that they are not sent to graze on it till a good fall of rain upon it once or twice has removed the surface manure. Farmers will find the geese from their yards of valuable assistance to them in laying down new grass.

On a newly laid lawn, care should be taken that the geese do not go over it immediately after, or during rain, as they will bore unsightly holes in order to get at the water below the surface. They should be fed at the side of the lawn, and a little movable pen, like a small sheepfold, made of wire netting, can easily be constructed. The wire should be about eighteen inches high, and can be rolled into a very small space. Light iron rods keep the netting upright, and it can be transported to different parts of the ground without trouble. The manure is excellent for the grass, and assists the turf to solidify.

Those who want to make a start, can purchase young birds in Leadenhall Market at from 3s. 9d. to 4s. After a time the fattest of these can be killed off; and poulterers are always glad to buy fine geese at from 8d. to 1s. a pound. Geese like oat-straw to stand upon, and in their nesting quarters better than any other. They will go

straight to their roosting place at night from their run, if an opening be made for them. In feeding young geese, it should be remembered that nothing is better for them than a supply of onions. It will not be difficult to obtain these, for if old onions are made to sprout, numerous young shoots will burst from all parts. Chives are also useful, and the geese enjoy the clovers, burrs, and dandelion leaves that they find in the hedges.

Vast quantities of geese are annually sent over from Ireland to London and the larger English manufacturing towns; and even these, which are not the primeest birds, seldom fetch less than 8d. a pound. They are not forward enough, however, to compete with the English green geese or goslings, nor to secure the high prices paid for early birds.

#### **STATISTICS FROM THE BOARD OF TRADE RETURNS CONCERNING IMPORTS OF EGGS.**

Figures are dull reading, but we give a few from the enormous totals concerning our foreign poultry bill, taken from the statistics of the Board of Trade Returns, in the hope that it may induce some of our English producers to consider whether it is not a suicidal policy to permit our neighbours to absorb so much of our money. In the present frightfully depressed state of Agriculture, any suggestions that might help to put a few pounds in the farmers' pockets, are attentively considered, and as there is no doubt that poultry keeping under proper conditions can be made highly profitable, it seems a fact very much to be regretted that it is neglected by so large a number of our farmers. Unfortunately this branch of farming does not receive the attention that it should, in too many instances, or else is carried out on such a "happy-go-lucky" and unscientific system, that it is not a success. With the advantages possessed by the average farmer in the shape of ample space, and "tailings" or the inferior kinds of corn after threshing, the production of eggs



surpasses one's powers of numerical comprehension. They are calculated and stated in the estimates of the Board of Trade, as in "long hundreds," that is to say, by the hundred-and-twenty. Multiplied out, they reach the following almost incredible totals:—

### Imports of Eggs, in Quantities.

	1890.	1891.
From France ... ..	370,710,600	374,370,480
„ Germany ... ..	349,858,920	325,380,080
„ Belgium ... ..	231,297,240	212,178,600
„ Other countries...	283,082,760	363,110,880
	1,234,949,520	1,275,040,040

The net increase of eggs and poultry imported in 1891 over that of 1890, was £75,716. This is sufficient to shew that the progress is in the reverse direction of British enterprise.

After these astonishing figures, no one who considers them at all attentively, will doubt that our poultry supply question is an important one. That the foreign trade in eggs should bear such a ratio to our own, is evidence enough that there is ample room to develop home industry in this direction. The greater part of the immense sum paid out annually for foreign produce should be diverted into our own country districts, and to Ireland, which already does a far better share in poultry raising than we do. Might it not help to solve the "Irish Question," if we did half the trade with her, that we do, say, with France? But we must look for the multiplication of poultry keepers before we can hope to have found at all a satisfactory remedy for our inadequate Home Supply.

A Gold and Silver Medal were awarded T. CHRISTY & Co. for their exhibits at the International Health Exhibition, London, 1884.

### INCUBATORS.

When we hear from America that it is not an uncommon occurrence to keep from 500 to 4,000 laying hens through the winter, it is not

surprising to learn that in that land of "big things" Incubators have become an absolute necessity. One wants the experience of having kept 200 hens in a run from autumn to spring, when snow and frost have prevented their going out for weeks, to realize the plant required to keep the half of 4,000. The houses are constructed on the most approved principles, being arranged to keep the breeds separately—a point of great consideration with respect to show birds. Besides this, the utmost regard is shown to warmth and ventilation; for without healthy stock birds hardy chicks will not be hatched, and unless these are strong, they will not be ready either to gain the high prices of the early markets, or to compete in the shows. But it will not be long before these enormous poultry farms make a general move towards the Southern States, for the practical American mind never enjoys additional labour, if by any means this can be avoided. It would be a long time before even British energies would compete with some of the difficulties that the Yankees have hitherto overcome. Turnips and mangolds are stored for the fowls, and it is no slight task to make pits deep enough underground to keep them safe through twenty to thirty degrees of continuous frost, to say nothing of a possible fall to thirty degrees below zero. A large amount of cooked and hot food is given them, and the earth in these covered runs has to be continually dug over. Eggs command very good prices in the Northern States during the winter, and it is found profitable to send whole freight trains full of them up from the warmer and more favoured South.

Mr. Thos. Christy (for whose firm we have manufactured the incubators, etc., for 15 years) claims to be the first in England who brought artificial incubation into practical use, by introducing the well-known "Hydro-Incubator," based upon the French hot-water machines, which to this day are in vogue with our neighbours. Many readers will well remember the incredulity expressed at the Dairy Show in 1877, when Messrs. Christy exhibited for the first time

one of these "Hydro-Incubators." However, events were marching fast, and the Public International Incubator Contests of Hemel Hempstead in 1878 and 1879 soon compelled belief in the principles of Hydro-incubation, or artificial hatching by heat supplied from hot-water tanks, replenished every 12 hours. In the full public report of these trials, which was published at the time, the Hydro-Incubator distanced all competitors.

At the first one, in 1878, limited to 21 days' duration, No. 1 machine hatched 34 chickens from 45 eggs; No. 2 machine, 20 from 45 eggs, many of the eggs having not had time to hatch out when broken by the Judges, although containing live chickens. In 1879, when the incubators were allowed to finish hatching, and not limited to the 21 days, the "Hydro-Incubator" produced 69 birds from 71 eggs. Although such records were conclusive, it was found advisable to let the machines be proved still more highly, so they were sent for trial to the following shows:—

In every case a stranger worked the apparatus, and in each instance the Show Committee certified to the correctness of the report. At Sudbury (Suffolk) there were hatched 61 chicks from 66 good eggs; at the Kendal Show, 22 chicks from 24 good eggs; at Elgin, 36 chicks from 50 eggs; and at Cambs. Ornithological Society's Show, 37 chicks from 43 good eggs. These are results obtained from eggs laid in November and December, 1879, an exceptionally hard and unfavourable season. It is hoped that non-believers in artificial hatching took note of these public expositions of hatching by Christy's Hydro-Incubators.

Since then the construction of the machines has been steadily improved, and this year, we, having previously made arrangements with Messrs. Christy & Co. to take over their interest in the incubator, rearer, and general poultry appliance business, are offering to the public Thermostatic Incubators of a vastly improved pattern.

These incubators are constructed with the very best material

and workmanship, and contain all the improvements which have been suggested and have proved successful during the many years we have manufactured such machines.

One of the greatest improvements is in the regulator. We have found a motor that is in use in most observatories both here and on the Continent. It is the most sensitive, accurate, and reliable apparatus that we have ever seen, and we think we have been extremely fortunate in being able to adapt it to our machines.

These incubators are not only reliable and safe, but are so simple in construction that the most inexperienced persons can operate them. They have no complicated machinery to get out of order, and only require fifteen minutes' attention morning and evening.

The advantages incubators have over hens are many. They are always "broody," even in the winter, when hens cannot be induced to sit, and never leave the eggs entrusted to them. They hatch out a much greater proportion than hens at a quarter the expense, and the chickens are stronger, and free from vermin; and, in addition, make poultry keeping a pleasure, as well as a profitable industry.

In hatching with incubators, the machines should be given *the same amount of "peace and quietness" that is given to sitting hens.* Too much stress cannot be laid on this, as the eggs are undergoing the same process in each case; therefore the doors of the Incubator, or of the room in which it stands, should not be slammed to. With quiet, plenty of fresh air round the machine, and care in handling it and the eggs, good results are assured.

The eggs should be turned twice a day, they should be tested on the 7th and 14th days, and the infertile and addled ones removed, care being taken to avoid opening the inner door more than is necessary. Though eggs will hatch in incubators which would never start under hens, yet it is advisable for successful hatching



that the eggs should be selected in accordance with the hints given below :—

### EGGS FOR SITTING.

Both hens and incubators often get blamed for bad results of sittings which are purely to be attributed to either the staleness or some other fault in the eggs. A few *hints on Eggs* may, therefore, not be unacceptable. First, as regards freshness. Whenever it is possible, use eggs taken direct from the nest to the Incubator, but it is hardly ever worth while setting eggs more than three weeks old in winter or two weeks in summer. Older than this, the chicks, if they hatch at all, are generally weakly, and rarely live. A fresh egg has a scarcely-perceptible air-space, but every day this space increases, so that carefully inspected in the egg-tester, the air-space will show which eggs to set and which to utilise as food. The external layer of shell membrane dries harder and toughens each day the egg is kept, hence the importance of fresh eggs.

The following points cannot be too rigidly observed. Avoid VERY LARGE eggs, as also VERY SMALL ones, or those of an irregular shape. A hen's first egg is always clear. The egg-shell should be SMOOTH, and not ribbed, and perfectly free from spots. The small coloured marks on an egg (sometimes seen) show that the shell is thin in places, and through these thin parts the air acts more readily and dries the liquid portion of the eggs, and the embryo chick dies before the 17th or 18th day. Fresh eggs will generally travel without endangering their vitality, but as their age increases the risk becomes greater, by reason of the enlarged air-space allowing so much movement inside the shell, as to intermix the component parts of the egg. Fowls' eggs travel best, but goose or duck eggs run great risks, the yolk of these latter breaking, and mixing with the albuminous parts much more readily than in hen eggs. The eggs of hens take 21 days to hatch (often less when quite fresh);

partridges', 22 days; pheasants', from 24 to 28 days; duck, turkey, and goose eggs, 28 to 30 days.

Clear eggs, even after 6 or 7 days' incubation, may be used for household purposes, or given as food to the fowls. A certain risk is always run in buying eggs for incubation from villagers and strangers, but a stipulation of "not more than three days old" should always be made when eggs are wanted for sitting purposes, and they should be marked.

Before putting travelled eggs into the Incubator let them repose for some hours on their sides in a basin half full of wheat or other grain.

We must impress upon our readers the importance of only using fresh eggs for Incubator work if they want good results. Avoid very young pullets' eggs, and above everything see that your parent birds are properly mated, the hens running with cock birds of a different strain. Do not, for the sake of economy, mate up together all the birds, male and female, out of an expensive sitting of eggs. To produce good chickens the parent birds must be unrelated.

### THE IMPROVED THERMOSTATIC INCUBATOR

consists of an incubating chamber, with a heating tank of galvanized iron above, and an egg drawer or tray below, enclosed in a double-walled case with packing between. It is fitted with double doors in front, the inner one glazed to permit of free inspection of the eggs during the process of hatching without chilling the same.

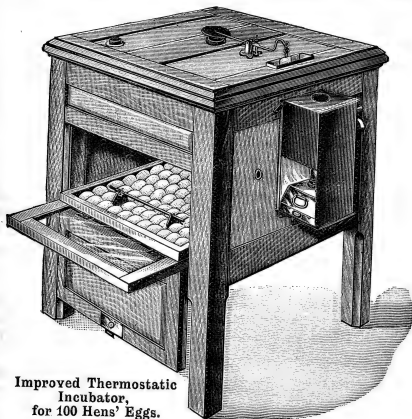
The incubating chamber contains water trays to supply the necessary moisture, and is supplied with fresh air by tubes through the sides. The pure moist air descends and circulates round and under the eggs, being constantly drawn down and through them by a hot-air exhaust shaft, which passes through the heating tank.

The heating tank is supplied with hot water from a copper boiler attached, and is fitted with a brass filling cap and emptying, or draw-off, tap.

The regulation is perfectly automatic; the motor is fixed in the incubating chamber, and moves the valves controlling the supply of hot water and the exhaust air shaft, with the slightest variation of the thermometer on the egg tray.

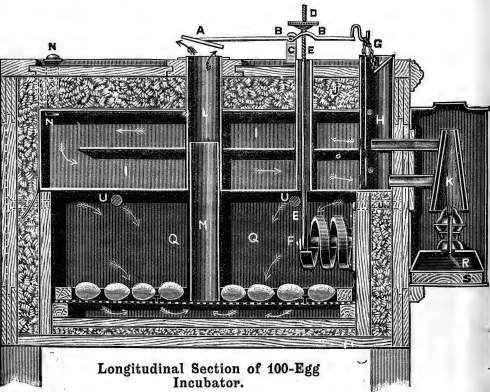
The following description of the details in sectional drawings will explain the working:—

A is the air valve controlling the exhaust air shaft L, and is attached to the lever B, which moves on the centre C. The lever B



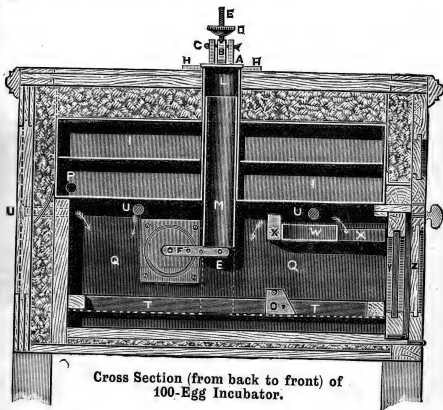
**Improved Thermostatic  
Incubator,  
for 100 Hens' Eggs.**

is connected with the motor by means of the rod E and the arm F. The nut D, screwed on the rod E, gives the necessary power of adjustment. As the temperature in the incubating chamber Q rises, the regulating motor expands and pulls down the arm F, and with it the connecting rod E, thus opening the air valve A, and, at the same



time, closing the water valve G. As the slide valve G descends it gradually cuts off the circulation of water from the boiler K to the tank I, until the circulation is entirely confined to the outer tank H, the lid of which has been opened by the same movement. J is the

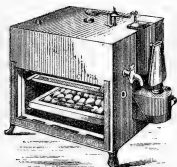
overflow pipe from the tank I into H. L is the air shaft, and M the sliding part of same, which should rest in its socket on the bottom of the egg tray T while the machine is working, but must be pushed up into L to permit the egg tray to be withdrawn.



**Cross Section (from back to front) of  
100-Egg Incubator.**

N is the filling pipe, which is also used for taking the temperature of the water with the long thermometer. O is the drawer thermometer stand; the mercury bulb must be in the lower hole, which should be level with the top of the eggs.

P is the outlet pipe to the tap. Q is the incubating chamber—*i.e.*, the space enclosed beneath the tank I. R is the lamp, and S the block which wedges same up into the boiler. UU are the fresh-air inlet pipes. W is the water-tray which supplies the necessary moisture, and X the fillets supporting same. Y is the inner glazed door, and Z the outer door.



#### 40 EGG METAL INCUBATOR

WITH SLIDE DOOR REMOVED SHEWING INTERIOR  
THROUGH INNER GLAZED DOOR.

oiled. Any of the Improved Thermostatic Incubators can be fitted with Atmospheric Gas-burners instead of oil lamps, if so ordered, at the same prices. We should, however, advise the use of oil lamps in preference to gas, as the latter, in most districts, varies so much in pressure.

The disadvantages attending most incubators fitted with continuous heating lamps and regulators are here done away with. The steam which arises from the outer tank so modifies the dryness of atmosphere occasioned by the continual burning lamp that not the slightest indication of a lamp-heated machine being worked will be found, even if closely shut up in a room for twelve hours.

If the lamp is kept clean, and the wick properly trimmed, it

If the slide valve G is kept well oiled, it will not only insure its easy working, but will prevent lime accumulating in the tanks and boiler. The slide need not be removed if an oiling can be used; a few drops between the slide and the face of the tank on which it slides, is all that is necessary. The axle of the lid over the outer tank H will also work better if

cannot smoke, and there is no risk of a puff of wind extinguishing the flame, nor the slightest danger of any part of the machine or surroundings catching fire from excess of heat, the flame being entirely surrounded by a water jacket.

Another important improvement is in the system of evaporation. In most incubators the water-trays have been placed beneath the egg-drawer, and the air entering beneath was supposed to absorb the moisture in its passage through it. It is a well-known physical fact that the higher the temperature the greater is the amount of moisture the air is capable of supporting. We have, therefore, placed the water-tray immediately under the heating tank, and the fresh air enters at the same level, the fresh air and moisture being drawn down and through the eggs by the action of the air-shaft drawing up the air under the egg-tray. The tray under the eggs should be filled with sand, kept moist.

We find duck eggs can be as easily hatched as hen eggs, and require no special precautions, such as damping towards the end of the time, an operation which is absolutely essential in many modern incubators. The eggs, which are placed at an angle of  $45^{\circ}$ , need only to be turned and left out for airing once a day, the air with which the egg-chamber is supplied being absolutely pure.

Another improvement with which the machine is fitted will be found very advantageous to many workers: we mean the glass door. Many like to see how the temperature stands, and how the eggs are progressing, and especially when the hatching time arrives do they like to be often looking to see how the chicks are hatching. This they can do quite well by means of the glass door. It is so arranged that the temperature is not influenced by opening the outer door.

### INSTRUCTIONS FOR STARTING AND WORKING.

1. Having carefully unpacked the Incubator, stand it in a position where it will get plenty of fresh air, without draughts, and

where it is unlikely to be shaken. It is desirable to choose a room of normal temperature, such as a spare bedroom. The high temperature and impure air of, say, a kitchen, or the greatly varying temperature of a greenhouse, are both undesirable.

2. Remove any straw or other packing which may have got into the outer tank or tubes, and examine the valve and lever. The disc forming the air-valve A should always fall back into its position, closing the top of the air-shaft except when held up by the regulator.

3. Turn the set screw nut D as high as it will go. Place the short drawer thermometer in the wire stand with the mercurial bulb in the *lower* hole, and see that the air-shaft M rests in its socket on the bottom of the egg-tray.

4. Unscrew the filling cap N, and fill the tank (using the large funnel sent with the machine)\* with water at about 120°. The water should stand an inch below where the overflow pipe J enters the tank H. If too hot it will necessitate waiting until it cools to set the regulator, and cold water makes the tanks "sweat," besides wasting time getting up the desired temperature. Half boiling and half cold will be found to give nearly the desired heat. The temperature of the water is taken with the long tank thermometer down the pipe N. The bulb must be lowered to the bottom of the tank, and not rested on the centre division. Withdraw the wedges beneath, and remove and fill the lamp. Light the lamp, leaving a medium flame, and wedge tightly up into boiler.

5. When the drawer thermometer in its stand on the egg-tray registers 100°, the nut D should be screwed down the rod E until it rests on the lever B. As the temperature of the incubating chamber rises the regulator will open the air valve, and at 102° will begin

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\* With all water-heated machines (rearers, etc., included) the funnel should always be used when filling with water. More machines are spoilt by the constant spilling of water over the top than in any other way.



cutting off the circulation between the tank I and the boiler until at 104° it will not admit more than necessary to maintain that temperature. Now open the doors, remove the water-tray, slide up the air-shaft, and withdraw the egg-tray, and place the eggs in same. Replace the egg-drawer, and pull the air-shaft down into its socket. Fill the water-tray at the tap of the machine, and replace on its fillets.

6. The regulation will proceed by itself. Suppose you wish for a higher temperature in the egg-drawer, lower the air valve by turning the screw nut. If a lower temperature is desired, raise the valve a trifle by the same means. Do not have so large a flame burning that the air-valve is wide open and the water-valve shut off constantly. During the main portion of the day the air-valve should be open about half-way and the water-valve half shut.

7. Trim the wick and refill the lamp at least once a day. Always remove the wedges on which the lamp rests, before trying to take the lamp away; the tighter a lamp fits up into the chimney, the better it will burn. Remember **never** to quite fill the oil reservoir. Cut the wick level, just shaving off the extreme sharpness of the corners. What is required is a broad flat flame reaching almost from side to side of the lamp chimney. If the least point or horn of flame appears when turned up, the lamp is not properly trimmed. After burning a few minutes, the flame of oil lamps increases slightly, therefore never turn to the highest possible point.

8. Turn the eggs twice a day for the first ten days, afterwards once only is necessary, and always turn them before trimming the lamp, taking care that your hands are free from oil. When turning in the morning, cool the eggs for five or ten minutes. While turning and cooling the eggs it is well to close the inner door of the machine.

9. The water-tray should be replenished from the tap twice a day, and the tank should be filled up at least once a day.

10. For the lamp, use good paraffin, kerosene, or crystal oil, and wipe dry and clean each time after trimming the wick.

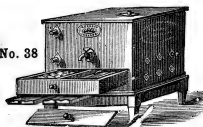
11. The bulb of the thermometer must be on the level of the top of the eggs; the stand supplied can easily be raised or lowered.

12. If at any time the screw-nut should inadvertently be screwed up instead of down, and the temperature rise above that desired, an easy way to lower same is to draw off a portion of water from the tap and replace with cold, when, as the temperature lowers, the nut can be set correctly.

### HYDRO-INCUBATORS.

As a good many Hydro-Incubators are still sold second-hand, it may be as well to give a sketch of them, with a very brief description of their mode of working.

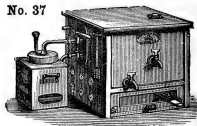
No. 38



HYDRO-INCUBATOR FOR 90 EGGS,  
ON STAND WITH DRAWER SUPPORT.

**RULES OF WORKING.**—Draw off night and morning and replenish, boiling, 2 to 4 gallons water. Turn the eggs and air them from 15 to 20 minutes.

No. 37



HYDRO-INCUBATOR FOR 90 EGGS,  
WITH LAMP AND CIRCULATING BOILER.

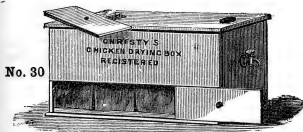
**RULES OF WORKING.**—Light lamp, open cocks, and allow the water to circulate for an hour or so, producing same result as changing 2 to 4 gallons of water.

### ARTIFICIAL CHICKEN AND GAME REARING.

The chicks hatched out, it is now time to think of what is to be done with them.

In the first place, not the slightest fear need be entertained of harm in the event of their hatching out some hours before the egg-drawer is again visited. Though in the drawer twelve hours, they

would not hurt, especially in the new pattern Thermostatic Incubators, where so much fresh air is provided. When removed, they should be placed in the DRYING BOX. This is provided with a padded



tank lined with flannel underneath, and is filled with boiling water a few hours before the chicks are placed in it. The chicks nestle underneath the flannel just as they would under

a hen, or as they do later on, under the Chicken-Rearing Mothers. The drying box can be used for the first few days, if desired, but a quart or so of water must be taken out and replaced boiling every twelve hours. Felt or flannel is put on the floor of the drying box, the tank emptied, and the whole aired and cleaned after the probationary twenty-four hours between the incubator drawer and the Foster-mother has been passed by the chicks. A thermometer pressed up against the felt under the cistern in the drying box should give about 80 degrees. In very cold weather, cover the top with a thick rug at night-time, or leave it in a warm room.

After twenty-four hours passed in the drying box, the chicks will be found crying lustily for food, and are then transferred into one of the Rearing Mothers described in the following pages.

Before entering into the minute description of the different kinds of rearers, we should like to say a word as to the artificial rearing of chickens in general.

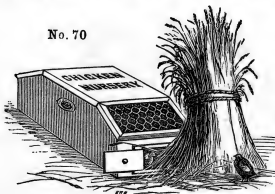
The secret of success with artificial rearers is to heat them moderately, and to have abundance of fresh air. If you provide an artificial rearer, for warmth, frames or shedding to keep them dry, and allow free access to the open air, your chicks will thrive, no

matter how cold the weather; but *don't* try to coddle them indoors, or you will inevitably fail. Warm rooms for chickens are a vast mistake. They look splendid up to a fortnight or three weeks old, and then off they go, one after the other, to your utter despair. Cramp and weak legs will account for every chick.

For rearing the artificial mothers are doing good work, and are very useful. If plenty of fresh air be given, the chicks will thrive well, and be strong and healthy. As we have previously stated, change of food is essential, and plenty of finely-cut green food is most nutritious. Avoid any large seeds—such as maize—while the chicks are quite young; and too much sloppy food is not advisable.

### THE AUSTRALIAN AND COLONIAL REARING MOTHER

No. 70



No. 71



has given great satisfaction, for it will rear the chicks when taken from the drying box, for with some air they can be kept there for a day or so, and they do so well. No rearing-mother has been more successful in the Colonies; so much so, that we make them into blocks of six, ready for erection in the Colonies, thus saving a considerable amount of freight.

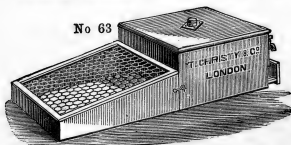
The floor enables you to transport it to any fresh ground.

It is surrounded with sheaves of straw, or, better still, wheat, barley, or oats, with the grain remaining on the ear. Game will go in and brood under the flannel and feathers. The chicks are perfectly safe from vermin, and use the Rearing-Mother as long as they can crawl under it. There is perfect ventilation for warm weather, and it can be left out at night.

Price 18s. 6d. each. In block, £4 15s. per block of six, F.O.B.

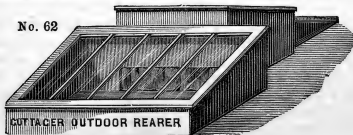
**The Cottager Rearer**, No. 59, is a cheap machine for 50 chicks, for use under cover in a glass-covered house, or shed. It is strongly made, with dove-tailed corners, and is stained and varnished. It is heated with hot water, by drawing off a portion from the tap and replenishing with boiling. The price is £1.

No. 63 is a similar machine, with the addition of a wire-covered



run 3 ft. x 2 ft., stained and varnished. (Price, £1 10s.)

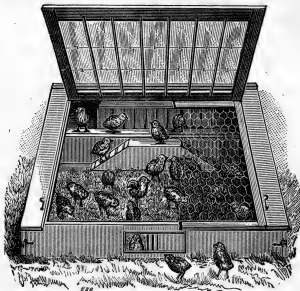
No. 62 is a stronger form of the above, but made with a sloping



roof and glass-covered run, and is painted three coats for use out of doors. (Price, £2 5s.)

No. 66 is a superior form of the above, with double sashes to the run, and is fitted with a copper boiler and lamp enclosed in a Japanned metal screen. The top glazed sash can be raised and fastened back in fine weather, leaving the run protected by the wire-

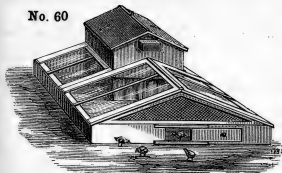
No. 66.



covered sash, which in turn can be lifted to place food, etc., inside. It has a sliding door in front for the chicks to run in and out of. The price is £3 17s., and for a similar machine for 100 chicks (No. 67) £5.

The well-known "Foster Mothers" of Messrs. Christy & Co. are now made larger and stronger, and are finished in the best manner. The large glass-covered run has an entire wood bottom making it an excellent machine for the wet and cold seasons. No

No. 60



stronger chicks can be reared than there have been with these "mothers." They are provided with copper boilers, lamps, and screens, and the prices are:—No. 60, for 50 chicks, £4 4s.; and No. 61, for 100 chicks, £5 5s.

All the before-mentioned mothers, or rearers, are provided with brass filling caps and emptying taps, and have tray-bottoms, which may be withdrawn for cleansing.

With the lamp-heated machines there is no risk of the lamp going out, or smoking, or catching fire. They consume very little oil, and need little or no attention. Indeed, so well and warm are the mothers constructed that, except while the chicks are very young or the weather exceedingly cold, the lamps need not be lit except at night, and in the summer, with chicks over a week old it is unnecessary to light at all.

The runs are well ventilated, the sashes are glazed with strong glass, and are thoroughly waterproof; the exterior of the machine is painted three good coats in oil.

With each 50-chick outdoor rearer is sent two chicken feeding blocks (No. 96), two drinking fountains (No. 50), and two feeding troughs (No. 53); and four of each with each 100-chick rearer.

Let your chicks out every day, no matter how cold (but choosing dry moments); after the fourth or fifth day, at first for only a few minutes, gradually increasing their airing, until in a week or a fortnight, according to circumstances, they may be left to run in and out, just as they please.

**The Cottager Open-Air Rearer** (No. 62 and Nos. 59 and 63) is heated by filling with boiling water through a funnel, leaving it for twelve hours before putting chickens under, and afterwards keeping up the temperature by a supply of boiling water once or twice in 24 hours, from one to two gallons each time, or more if necessary. The operator must judge the quantity, according to the temperature of the atmosphere, making allowance for its variations, and also proportionately to the number of chicks contained in the artificial mother. The best temperature to keep up is about 60 to 70 degrees,\* but by pressing the hand up towards the loose flannel, lining the bottom of the cistern, it can be at once determined if the heat on the backs of the young birds is sufficient or not.

When the rearers and drying boxes are not being used, they should be emptied and the taps and caps left open so that the air may circulate inside the tanks to dry them. The flannel lining (which can easily be removed, and is cheap) should be replaced with new, and the inside of runs whitewashed every three or four months if in continual use.

### **FATTENING BIRDS.**

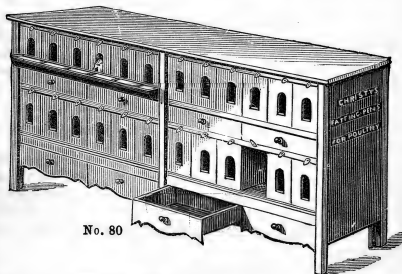
The chickens thus reared are, in the majority of cases, destined for table purposes, and here we desire to give a word of warning to amateur poultry breeders, as well as to farmers, who get their birds nicely grown and a good size, and who jump at once to the conclusion that they are marketable. This does not, however, follow. Your four months' chicken may have a big frame, and the making of a good table fowl, but people will not buy him if not fat. Unless he carries flesh on his frame, and is decently killed and dressed, only disappointment will accrue when the account sales come in from your market man. These two points of putting a final touch on the birds, which really means fattening them for ten or

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\* This applies to all rearing mothers.



fourteen days, and again, of properly dressing them, are of vital importance. They mean to the producer the exact difference between profit and loss.



No. 80

FATTENING PEN FOR TWENTY-FOUR BIRDS.

All things considered, the most certain way of effecting the first of these objects is to shut them up for the time specified—viz., ten to fourteen days—in properly constructed pens. In the drawing we show a 24-bird fattening coop, in which each bird is confined by itself in a separate compartment, with moveable front, a trellis-work bottom—also removable—and trays to catch the excrement. Troughs are placed in front for food and drink. These coops or pens are made in various sizes—viz., for 24 birds, for 12 birds, for 6, and for 4 birds; and the following is the treatment and food, as practised in France, where the finest fat poultry in the world can be seen at the Paris Cattle Show.

Feed about every three hours; the earlier in the morning the

first meal is given the better. Diet should consist of buckwheat meal, mixed with skim milk, to the consistency of crumbly dough. Next to buckwheat meal, I prefer Sussex ground oats mixed in the same way, and a little mutton suet can be added to either with advantage. For drink, milk in moderation is best. After feeding, remove the troughs for two to three hours, and then feed again. The drawers should be emptied night and morning, the loose bottoms taken out and scalded every ten or twelve days, and each compartment washed out with thin cement and water about once a month. Keep the pens in sheds or buildings moderately warm, and not too light. If they are out of sound of the other fowls at liberty, so much the better. For the first two or three days there will be no gain of weight; they then settle down, and will feed well for fourteen to twenty-one days. In winter you can keep them for a month or more in the coops if you want them very fat. In summer they will not stand confinement so long.

Cramming poultry can only be successfully done by hand. The meal is mixed with milk, and rolled out into pellets, or forced out by a screw press the correct size. Each pellet is dipped in milk, and passed down the throat of the fowl until you feel the crop is full with your left hand.

### THE TELL-TALE EGG-TESTER AND EGGS.

Everyone well knows the disappointment arising from the number of infertile eggs found in many sittings, and the constant difficulty experienced in obtaining eggs that can be relied on. The egg-tester supplied with our Incubators will, however, enable the most inexperienced person to detect the infertile eggs a few days after they have been placed in the egg-drawer. These can be rejected, and their place supplied by others.



Fig. 1

Fig. 1 shews the egg-tester, with an egg as it appears five days after incubation, with its embryo chicken. In a darkened room the effect is more marked and the disc must be held up between the eye and a strong light. It is easy to detect those eggs which ought not to remain in the incubator.

Fig. 2 represents a clear or non-fertile egg five days after incubation. The round, opaque mass which shifts with every movement of the hand is the yolk of the egg.

Fig. 3 shews a fertile egg after five days' incubation. The yolk is expanded, and shews a semi-circle, darkening towards its base. The embryo is already formed, as may be seen by the blood-red



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

streaks converging towards it, and if it is vigorous, it should incline from right to left each time the egg is moved. If, however, it is dead, the red veins are dull and scarcely apparent, and the embryo seems fixed to the shell, and does not move. It looks as though it were a blot of ink in the egg.

Fig. 4 represents an egg after being eight days subjected to the action of the heat. It is the same as on the sixth day, but with the distinguishing marks more pronounced. The air space is also a little larger.

Fig. 5 shews a double-yolked egg of eight days' incubation. These eggs are usually non-fertile, but even if good, and the incubation progresses favourably, one of the chicks generally dies, and putrifying,

kills the second. Instances have, however, been known of both hatching out and doing well.

Fig. 6 is the egg fifteen days after incubation, when it has become nearly black. The air-space is enlarged, and at the top nothing but a few veins can be seen.

Fig. 7 shows the egg ready to hatch on the twenty-first day. It should be completely black, the air-space occupying nearly one-third of the egg. Some people say that by the shape of this air-space the sex of the chicken can be foretold.

Fig. 8 represents a spoilt or "addled" egg, which, instead of appearing something like a spider, shows a circle, or part of a circle,



Fig. 6.



Fig. 7.



Fig. 8.

blood red, and more or less regular. Generally speaking, nothing appears in the centre but occasionally some black spots may be observed.

Better still than being able to detect the infertility of eggs is the lessening the infertility itself. Food, and protection of fowls from wet and cold, are as necessary to this end as an adequate supply of male birds. In winter it becomes necessary to add extra nutriment to the food of fowls, and meat boiled down with plenty of green food will make an immense difference in the number of eggs, and not less in their fertility. The value at such times of the artificial foods is very great.

### THE NEW LAMP EGG-TESTER

Will be found a great boon to all poultry-raisers. It is fitted with a good lamp, giving a bright light, which is concentrated upon the egg, so that it can be thoroughly examined during incubation. The flame should be kept as low as possible.



No. 88.

### THE FEEDING OF YOUNG CHICKS.

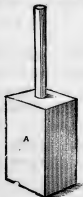
For food, we should recommend as follows:—

First 24 hours none; second and third day, custard, as recommended by Mr. Tegetmeier, is the best of any, or the usual bread-crumbs and chopped egg, crushed rice or millett, and boiled milk. From the fourth day, to the above-mentioned food may be added oatmeal porridge, mixed with either

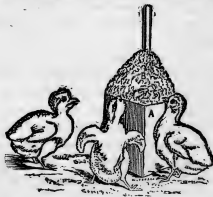


Nos. 53 &amp; 54

water or milk, or meal with curd. Raw onions, prickley comfrey, and lettuces cut up fine may also be given occasionally with great



No. 96.



advantage, and as much variation made, in the diet as possible. For liquids, either milk, or milk and water and this only from the fourth day, and then only sparingly.

Feed frequently, at first every two hours, giving freshly prepared food each time. Above all, never leave either milk or milk and water in their fountains more than one hour at a time. Galvanized iron troughs, two sizes, arranged as those shown here, with a bar along the whole length of them, will be found the most useful. The bar helps to keep the birds out. If small troughs and more of them are used, it will be found a better plan than larger utensils.

A capital paste for chicks is made by putting five parts oatmeal to one part cooked rice, mixed with milk and given them warm; if a little Papain is mixed, it will not only give the birds strength by stimulating their digestion, but improves the mixture; it should only be used occasionally, and is very good for them. To prevent waste, and give the young birds a little occupation, pile up paste on the little wooden pedestals, as shown in the accompanying drawings.

Curd and meal also makes a nice food for the chicks from a week old. The curd can most easily and quickly be made in small quantities, by putting the milk in a saucepan, and as soon as the milk comes to the boil, drop in a few grains of powdered alum, remove the saucepan, and after stirring once or twice the curd will form, and can be strained off through a cloth.

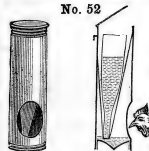
There is a great saving of food when the chicks are fed in this way, but care must be taken to keep the pedestals always under cover; even in grass runs there should be a building in which the chicks can take shelter in case of rain, and also to keep their food dry. Change of food is one of the great secrets of rearing fine birds, more particularly in cold weather, when they cannot get out of doors. It is better to have several pedestals, with a small amount of food on each, than let the birds crowd round one and knock it over—dirt only upsets your birds.

Plenty of green food is indispensable, and the drinking vessels ought to be so constructed that it is impossible for the chicks to get wet by treading in them. Till they are a month old, milk, or milk and water is the best beverage for them, and we have had made small drinking fountains, so as to entirely prevent the young birds



No. 50

getting in them. The bottoms should be loose, to allow of their being well scalded out frequently. Fed liberally, in the manner described, a four-months chicken should weigh a good 4 lbs.



No. 52

For a drinking vessel for adult fowls, we prefer the French plan of a bottle syphon to anything. They are as shewn in the drawing, and the directions for use are as follows:—

Fill an ordinary wine bottle with water; place the fountain over it; then reverse the fountain, and it forms a perfect syphon. It can be suspended from a hook in the wall or in the fence.

In France they use these Bottle Syphons for grain as well as water.

In the syphon here shewn the whole top lifts off, leaving only the saucer; thus this pattern can be easily and perfectly cleaned, and is for that reason the one we would recommend, especially if made of galvanised iron, not of zinc like the French ones are.

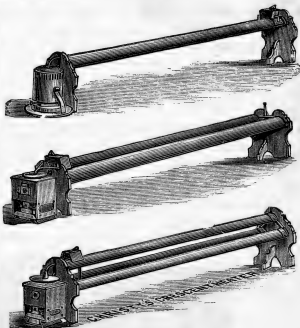
Split groats and wheat may be added later, and give a little meat once in a while, and above all plenty of exercise. They should always have access to water or milk and grit; some coarse sand should be mixed with their food occasionally.

No. 51



One of the principal reasons for the small quantity of eggs laid by fowls during the cold weather is a want of warmth in their houses. The small outlay necessary to purchase a small heater as below, would soon be more than repaid by the eggs from the birds kept in the house in which it was used.

**AN ECONOMIC GREENHOUSE HEATER**, with a good paraffin lamp, (burning 15 or 16 hours) as the heating power. Constructed with our CRESCENT-SHAPED IRON PIPES. Especially designed for heating small Greenhouses, Conservatories, Garden Lights, &c., in winter, and for forcing in spring. Our Crescent Piping has as much heating surface as ordinary 6 in. piping, but contains only one-twelfth of the water; it consequently requires a very small heating power, and is the most economical form of hot-water piping in the world.



**No. 73**—A small “CRESCENT” Heater, 24 or 30 inches long, suitable for fowlhouse ... .. **25s 6d**

**No. 74**—One 6-ft. length of “CRESCENT” Piping, with copper boiler, lamp (16-hour), evaporator; packing included ... .. **£2 : 5s**

Cost of working, 9d to 1s per week.

If the evaporator is omitted, and the packing-case returned, a No. 74 can be supplied for **36s** cash in advance.



**No. 75**—Two 6-ft lengths (or one broad length is recommended) of “CRESCENT” Piping, with copper boiler, lamp (16-hour) and evaporator, all complete, packing included ... .. **£3 : 10s**

Cost of working, 1s to 1s 6d per week.

**No. 76**—Three 6-ft. lengths of “CRESCENT” Piping, with copper boiler, large oil lamp (15-hour), and evaporator, packing included ... .. **£5**

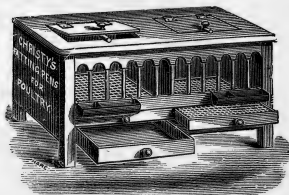
Cost of working, 2s per week.

**No. 77**—With three pipes, each 8 ft. long... .. **£5 : 10s**

Cost of working, 2s to 2s 6d per week. Recommended.

**No. 78**—**Special Garden Light Heater**, with lamp and 6 feet run of piping, equal to ordinary 4-inch. Price complete ... .. **35s**

Cost of working, 6d per week.



**DUCK FATTENING PEN. Price £2.**

## PRICE LIST.

(When telegraphing or writing, the number need only be used.)

TELEPHONE No. 4317. TELEGRAPHIC ADDRESS, "SPENCER, LONDON."

### IMPROVED THERMOSTATIC INCUBATORS.

No. 40.	For 25 Eggs	...	...	...	...	...	...	£3	0	0
" 41.	" 40 "	...	...	...	...	...	...	4	4	0
" 42.	" 50 "	...	...	...	...	...	...	6	0	0
" 43.	" 100 "	...	...	...	...	...	...	8	0	0

No. 44 (200 Eggs) and No. 45 (300 Eggs) made to special order.

PACKING IN CRATES INCLUDED. SHIPPING CASES EXTRA.

" 30.	Drying Box	...	...	...	...	...	...	0	18	0
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### FOSTER MOTHERS.

No. 60.	For 50 chicks...	...	...	...	...	...	...	£4	4	0
" 61.	" 100 "	...	...	...	...	...	...	5	5	0

This is an improved form of Hot Water Mother, same as hitherto used, but fitted with a copper boiler and lamp. The latter is enclosed in a metal screen, and will not blow out even in the highest wind. The broad tank overhead radiates the heat downwards, and a light lining underneath it makes a soft warm air-bag for the chicks to nestle into. This is the nearest possible approach to the warmth of a hen's body. The lamps keep the water at a fairly regular temperature, and burns for 24 hours, so that the attention required for this pattern Foster Mother is less than any other, while greater cleanliness and more air are afforded the young chicks.

No. 59.	The "Cottage Rearer" (hot water), for use under cover only, for 50 chicks or ducks, without run	...	...	...	...	...	...	£1	0	0
" 62.	Ditto (hot water) and glass covered run in which to feed chicks, for use out of doors	...	...	...	...	...	...	2	5	0
" 66.	Ditto with Lamp, Screen, and Boiler, and interchangeable glass or wire-covered run	...	...	...	...	...	...	3	17	0
" 67.	Ditto, all as No. 66, but for 100 chicks	...	...	...	...	...	...	5	0	0
2 Feeding Troughs, 2 Feeding Blocks and 2 Drinking Fountains sent with each 50-Chick Rearer, and 4 of each with each 100-Chick.										
" 70.	Chicken Nursery	...	...	...	...	...	...	0	18	0
" 71.	If in block (unereected for shipping), 6 for	...	...	...	...	...	(F.O.B.)	4	15	0
" 80.	Fattening Coup, 24 Fowls	...	...	...	...	...	...	10	0	0
" 81.	" " 12 "	...	...	...	...	...	...	5	5	0
" 82.	" " 6 "	...	...	...	...	...	...	3	0	0
" 86.	Egg Tester (Hens' Eggs)	...	...	...	...	...	...	0	0	9
" 87.	Set of Caponing Instruments (in leather case)	...	...	...	...	...	...	1	11	6
" 88.	Registered Egg Tester	...	...	...	...	...	...	0	3	0
" 89.	Poultry Keepers' Lantern	...	...	...	...	...	...	0	7	6
" 90.	Oil Can to prevent waste through spilling	...	...	...	...	...	...	0	2	0
" 91.	Drawer Thermometer	...	...	...	...	...	...	0	2	6
" 92.	Tank Thermometer	...	...	...	...	...	...	0	3	0

Packing Thermometer, in wood box, 6d. Postage 6d.

# REDUCED PRICES OF APPLIANCES.

## ARRANGED IN SETS.

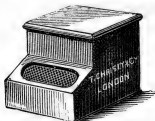
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<b>No. 46.</b> A 25-Egg Improved Thermostatic Incubator, a Drying Box, a (No. 60) 50-Chick Foster Mother, and all Fittings ... ..		<b>£8 0 0</b>
<b>No. 47.</b> A 40-Egg Improved Thermostatic Incubator, a Drying Box, a (No. 60) 50-Chick Foster Mother, and all Fittings ... ..		<b>9 0 0</b>
<b>No. 48.</b> A 100-Egg Improved Thermostatic Incubator, a Drying Box, a (No. 61) 100-Chick Foster Mother, and all Fittings... ..		<b>14 0 0</b>
<b>No. 49.</b> A 50-Egg Improved Thermostatic Incubator, a Drying Box, a (No. 60) 50-Chick Foster Mother, and all Fittings ... ..		<b>10 15 0</b>
<b>No. 46A</b>	{ All as Nos. 46, 47 and 49, but with a No. 66 substituted for the No. 60 Foster Mother.	<b>7 10 0</b>
<b>No. 47A</b>		<b>8 10 0</b>
<b>No. 49A</b>		<b>10 0 0</b>
<b>No. 46B</b>	{ All as Nos. 46 and 47, but with a No. 59 "Cottager" Rearer substituted for the Foster Foster.	<b>4 16 0</b>
<b>No. 47B</b>		<b>6 0 0</b>

*No Allowances can be made for Returned Crates. All Thermometers are properly packed, and sent at Purchaser's Risk.*

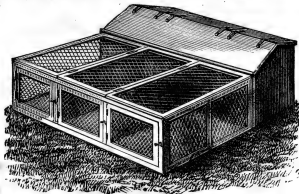
Full description as to Railway and Station should accompany each Order.

For Terms, see Page 2.



Price 17s.  
each.

**"CARRYING BOX,"** for 50 small Chickens, with Park. This makes an excellent small Dry Mother for Chicks over a week or two old, if they are at all crowded.



Price £4.

**COCKEREL HOUSE, or Combined Coop,** for three broods of Pheasants or Chickens. Dimensions of each of the three houses, 2 ft. 6 in. high  $\times$  2 ft. square. Length of run, 4 ft.

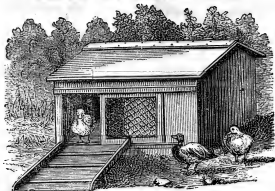


### Dog Boxes.

Size No. 1.	24 inches	$\times$ 14 inches	$\times$ 18 inches high	...	£1 10 0
" " 2.	36 "	$\times$ 22 "	$\times$ 23 "	" " "	2 0 0
" " 3.	44 "	$\times$ 24 "	$\times$ 33 "	" " "	2 15 0
" " 4.	50 "	$\times$ 30 "	$\times$ 36 "	" " "	3 10 0

## GOOSE OR DUCK HOUSE.

No. 10.

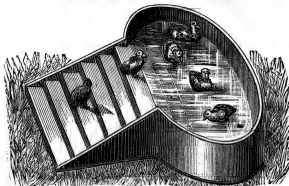


No. 10. Dimensions, 26 in.  $\times$  20 in. (painted ... .. £1 7 6

Can be supplied in frames for sending away, and merely wants a few screws putting in to erect it. The sloping board shuts at night-time, rendering it vermin proof.

## METAL DUCK BATH.

No. 11.



This can be stood in the tray of the Open-air Rearer if desired.

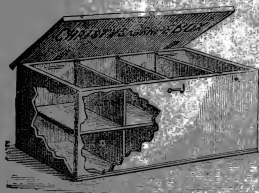
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## FRUIT BOXES FOR RAIL TRANSIT.



Each box is fitted with moveable wooden partitions, making eight divisions, each 10 in. long. Holes at the ends of the division enable the sender to tie each bunch of grapes by the stalk, and string holes are made at the top, so that the ends can be sealed to prevent tampering or pilfering on the journey.



Made of stout wood, planed and hinged, with fastenings and holes, through which a string can be passed and sealed on the top to prevent all tampering or pilfering. Moveable wooden divisions keep each Peach, &c., in its place. Wrapped in wool or tissue paper, they fit in firmly, and never bruise. Stencilled "Fruit."

"Made in a simple, but effective manner, and very cheap."—*Gardener's Magazine.*

**SEND FOR PRICE LISTS.**

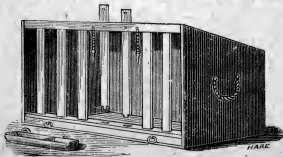


To follow the Plough.



Portable.

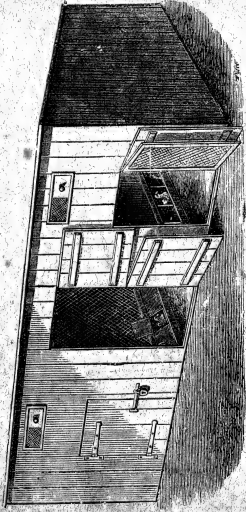
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